



SEEA Experimental Ecosystem Accounting: Valuation of Biodiversity

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Copenhagen Consensus 2012: Biodiversity

challenge paper

BIODIVERSITY

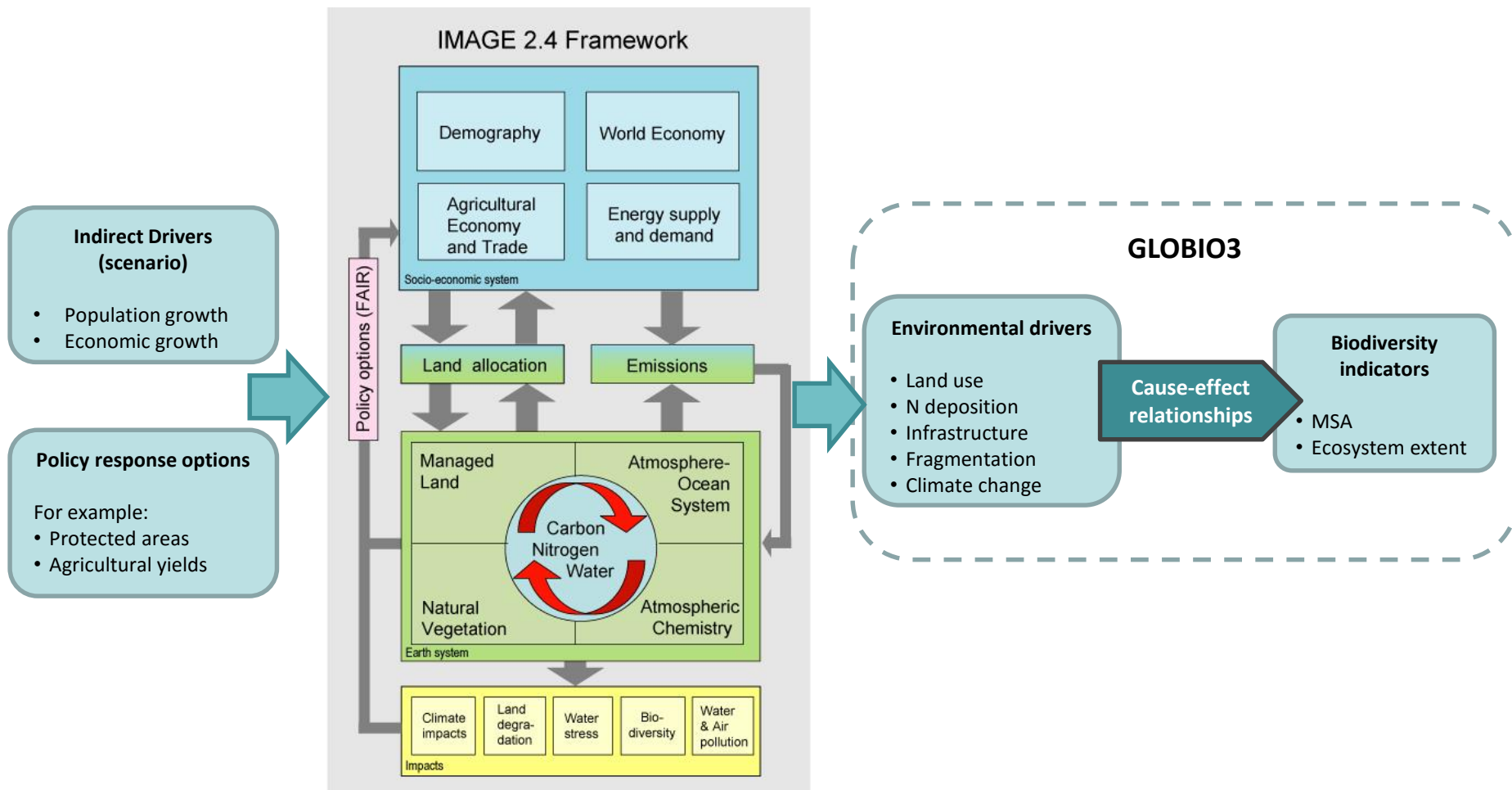
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IMAGE/GLOBIO3 model framework



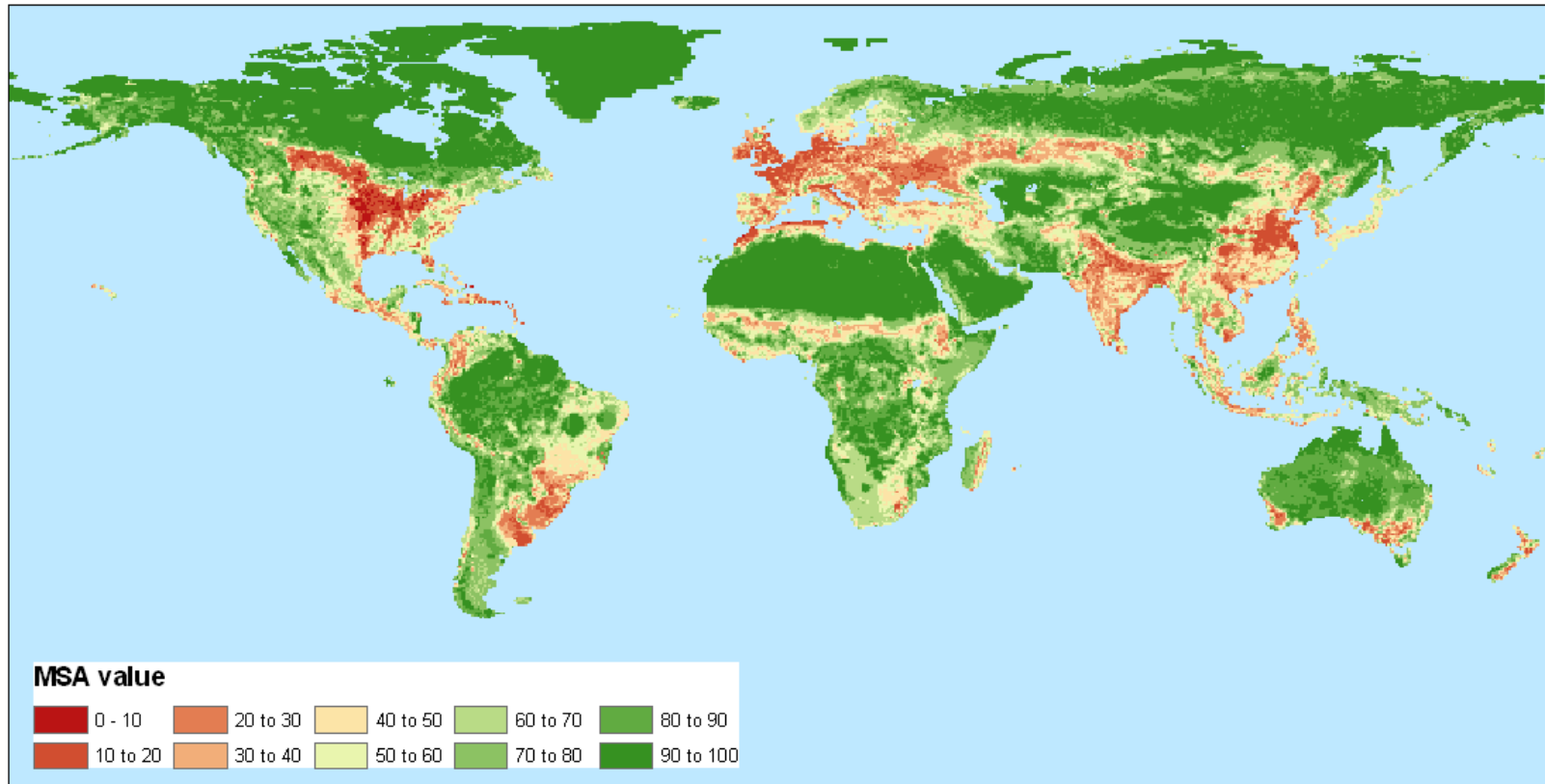


1. Biophysical model - baseline scenario

- Baseline developed from OECD projections:
 - World population grows from 6 to 9 billion
 - Fourfold increase in economic output ($\sim 2.8\%$ per annum)
 - Agricultural productivity increases by 60% between 2000 and 2050 – does not keep pace with population or consumption patterns
 - No change in environmental or trade legislation
 - Global mean temperature increases to 1.6°C above pre-industrial level
 - No change in protected areas (14%)

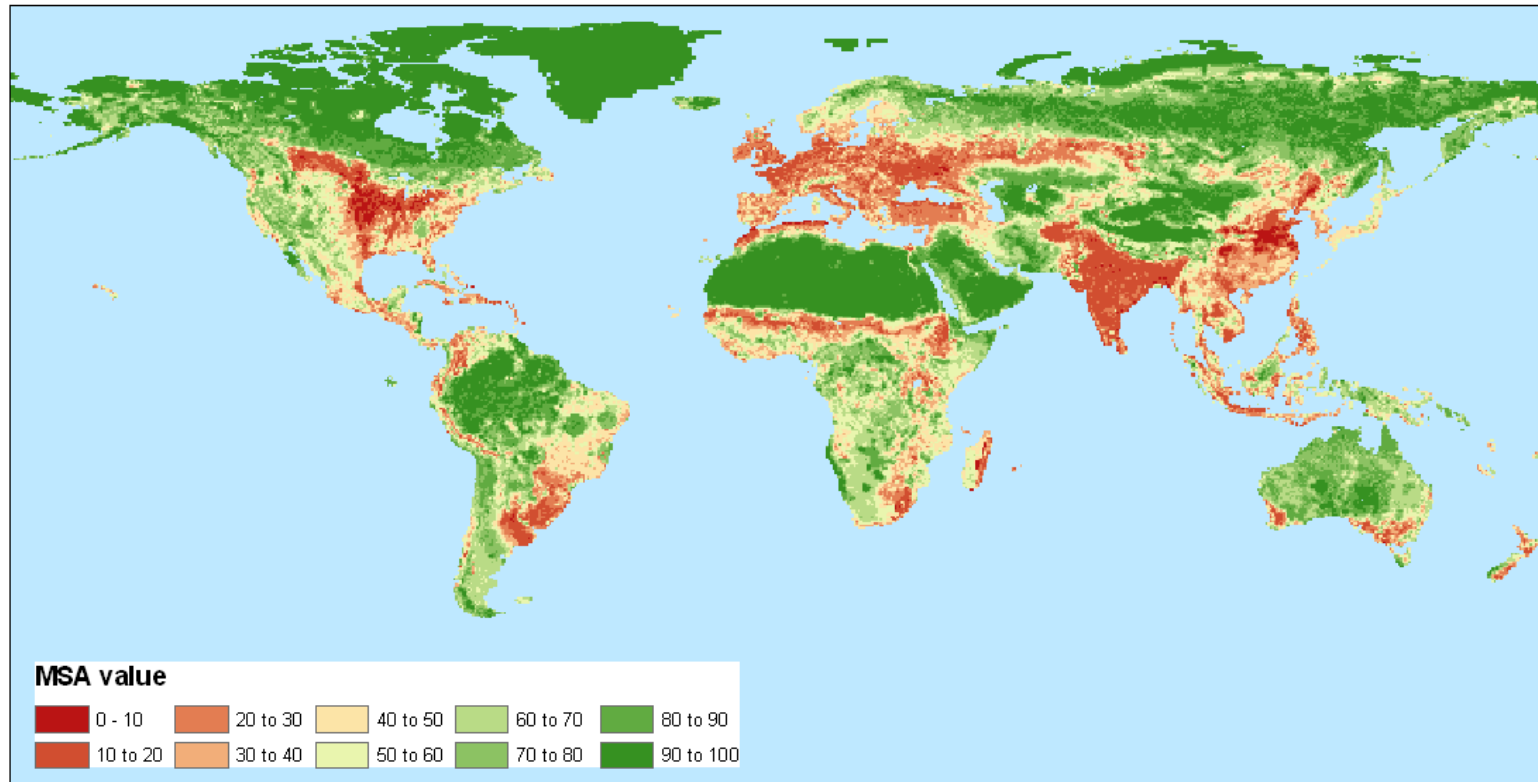


1. Biophysical projections: Mean Species Abundance 2000



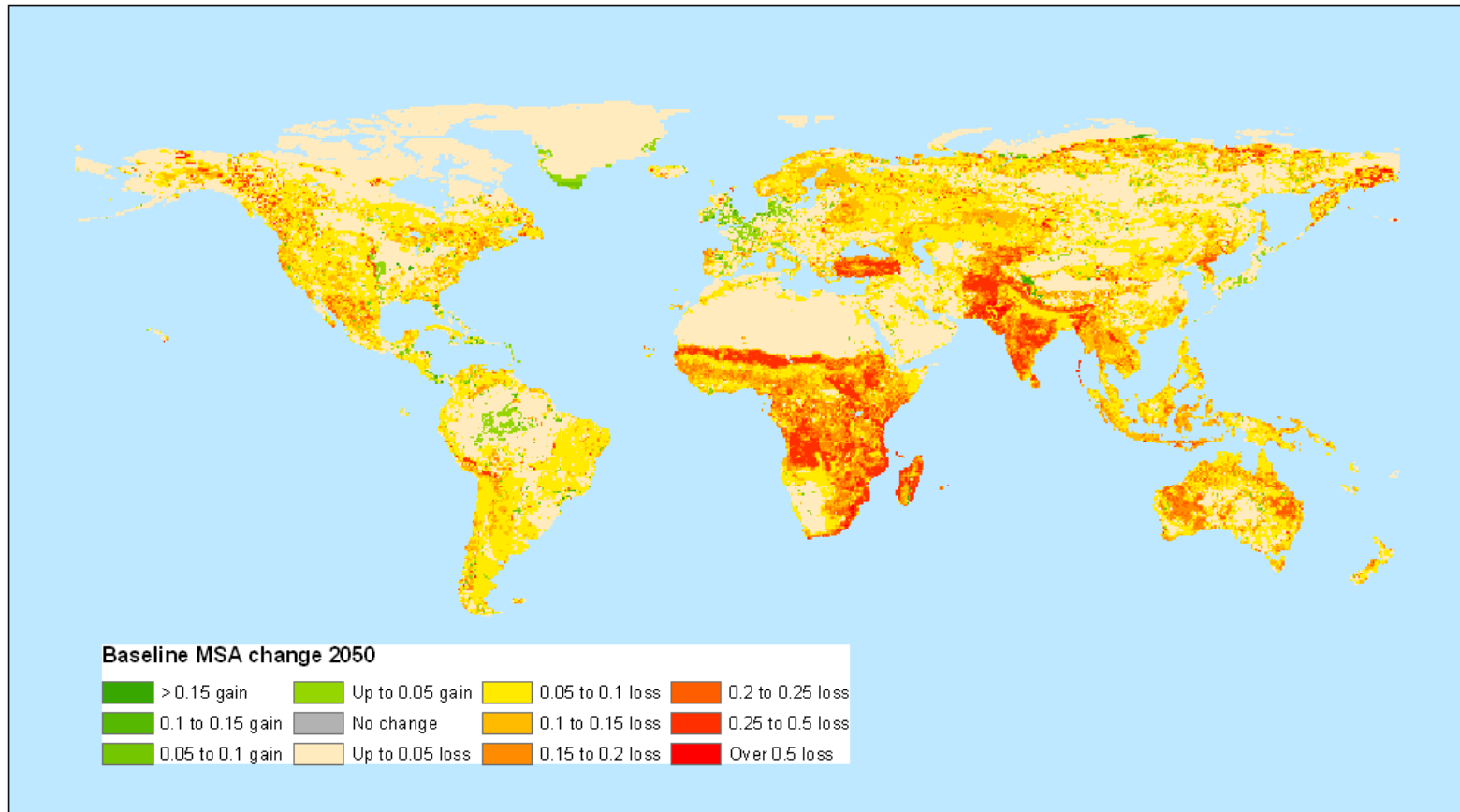


1. Bio-physical projections: Mean Species Abundance 2050





1. Bio-physical projections: Baseline Mean Species Abundance change 2050





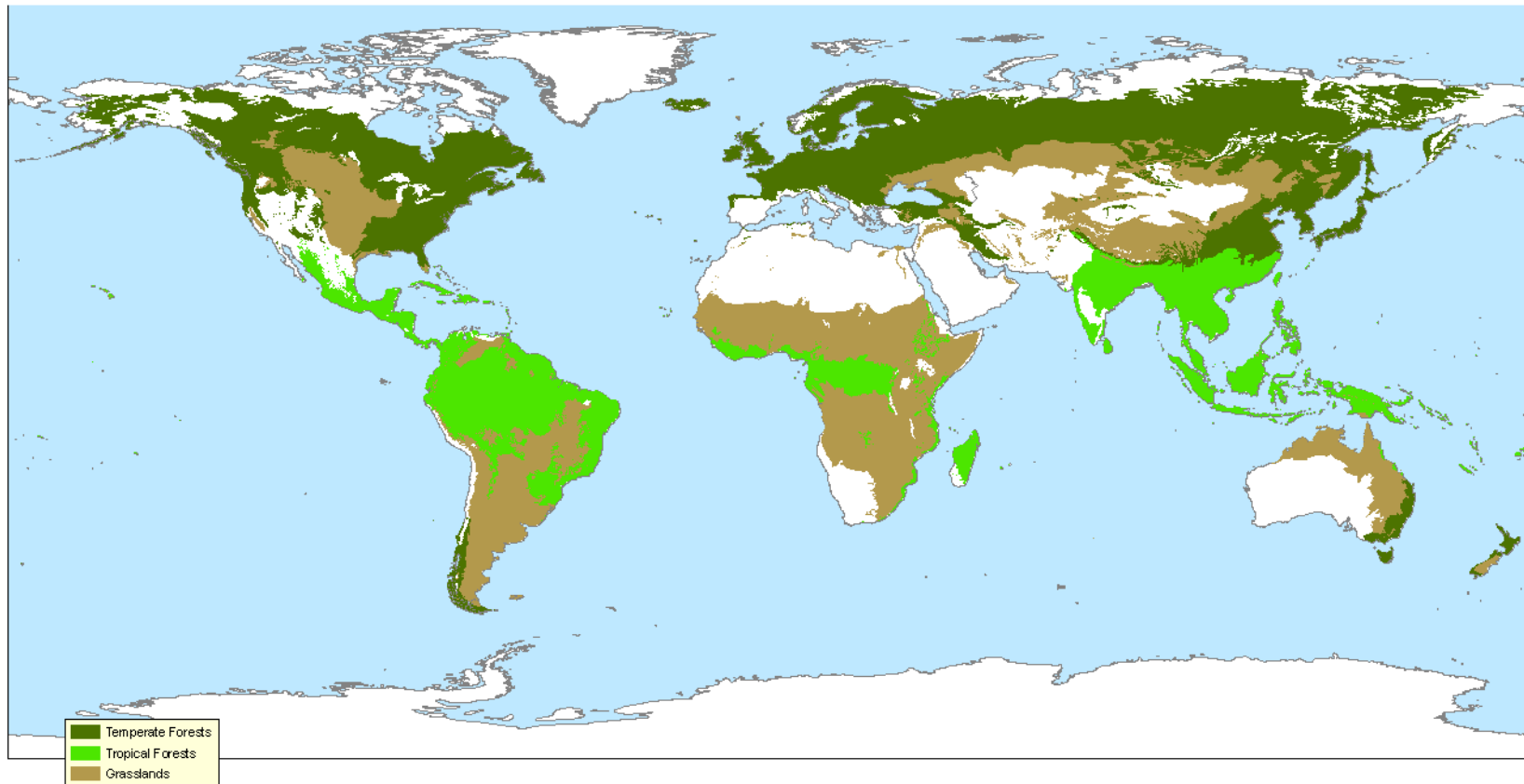
2. The methodological framework

1. There are a total of *circa* **2.3 million patches** of temperate forest, tropical forest and grassland
2. Each of these patches yields **ecosystem services** which contribute to societal welfare
3. The **location and extent** of patches is predicted to change in 2030/2050 under BAU
4. The value of a patch is patch-specific and depends on **local characteristics** (ecological, economic, context)



2. Terrestrial biome coverage: biomes assessed in the study

Terrestrial Biomes



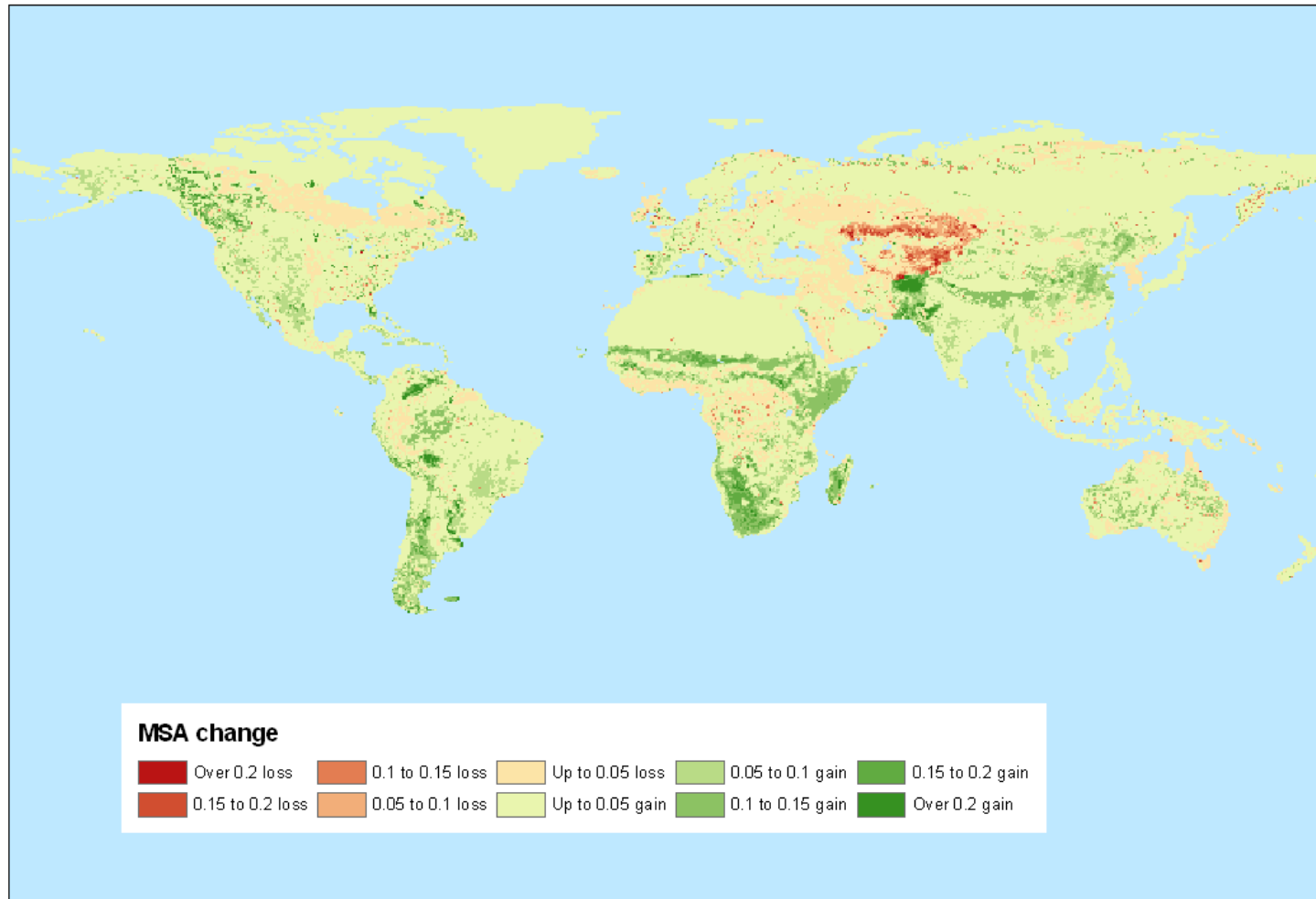


3. Policy option: Agricultural productivity (AKST)

- Option summary:
 - The baseline assumes that the **current levelling-off of agricultural productivity** growth persists: cumulative growth in productivity of 60% to 2050 relative to productivity in 2000.
 - Under the policy option, productivity growth is spurred by investment in Agricultural Knowledge, Science and Technology (AKST), ***increasing productivity growth by 40% and 20% for crop and livestock respectively, relative to the baseline.***

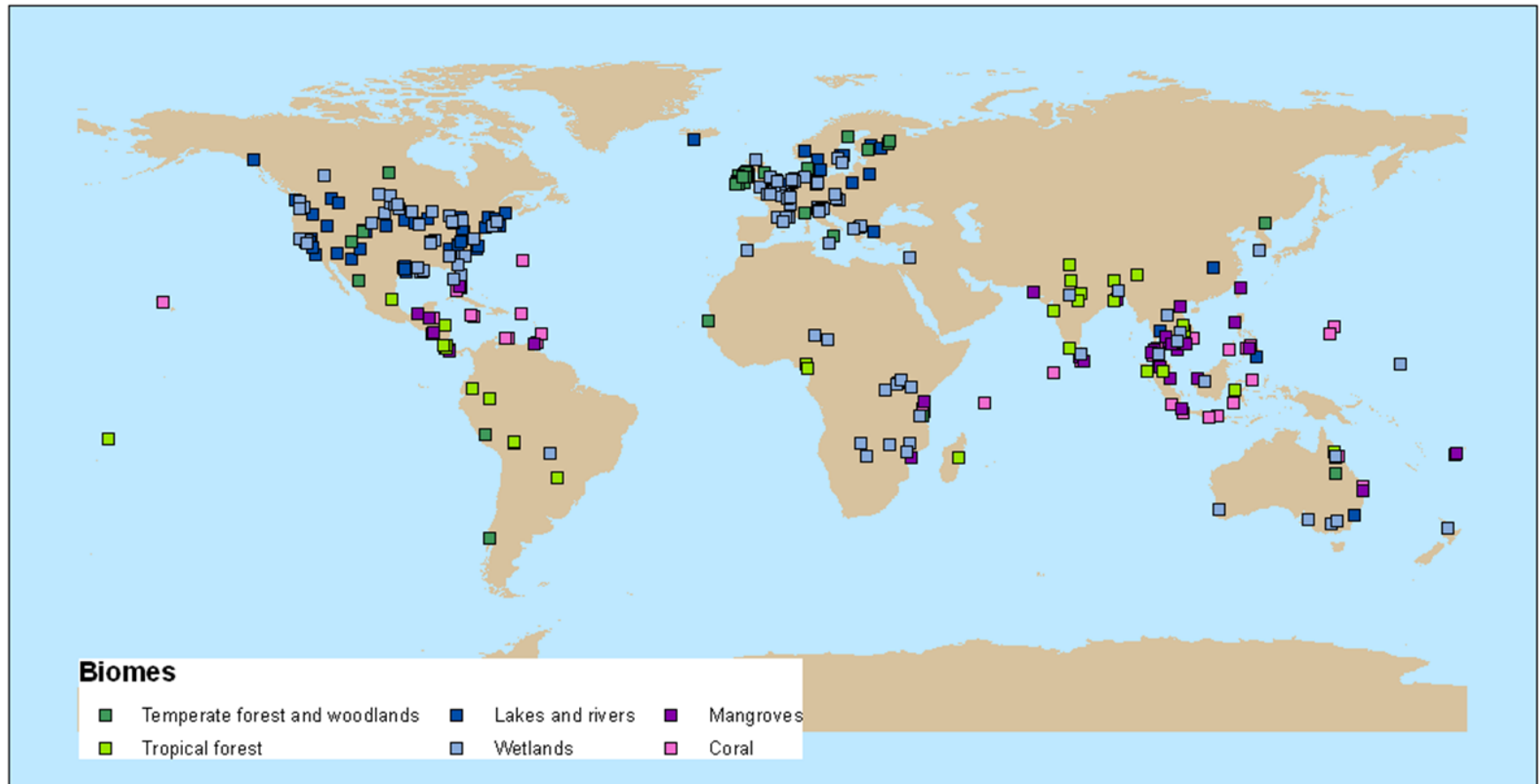


4. Mean Species Abundance change: AKST vs. BAU





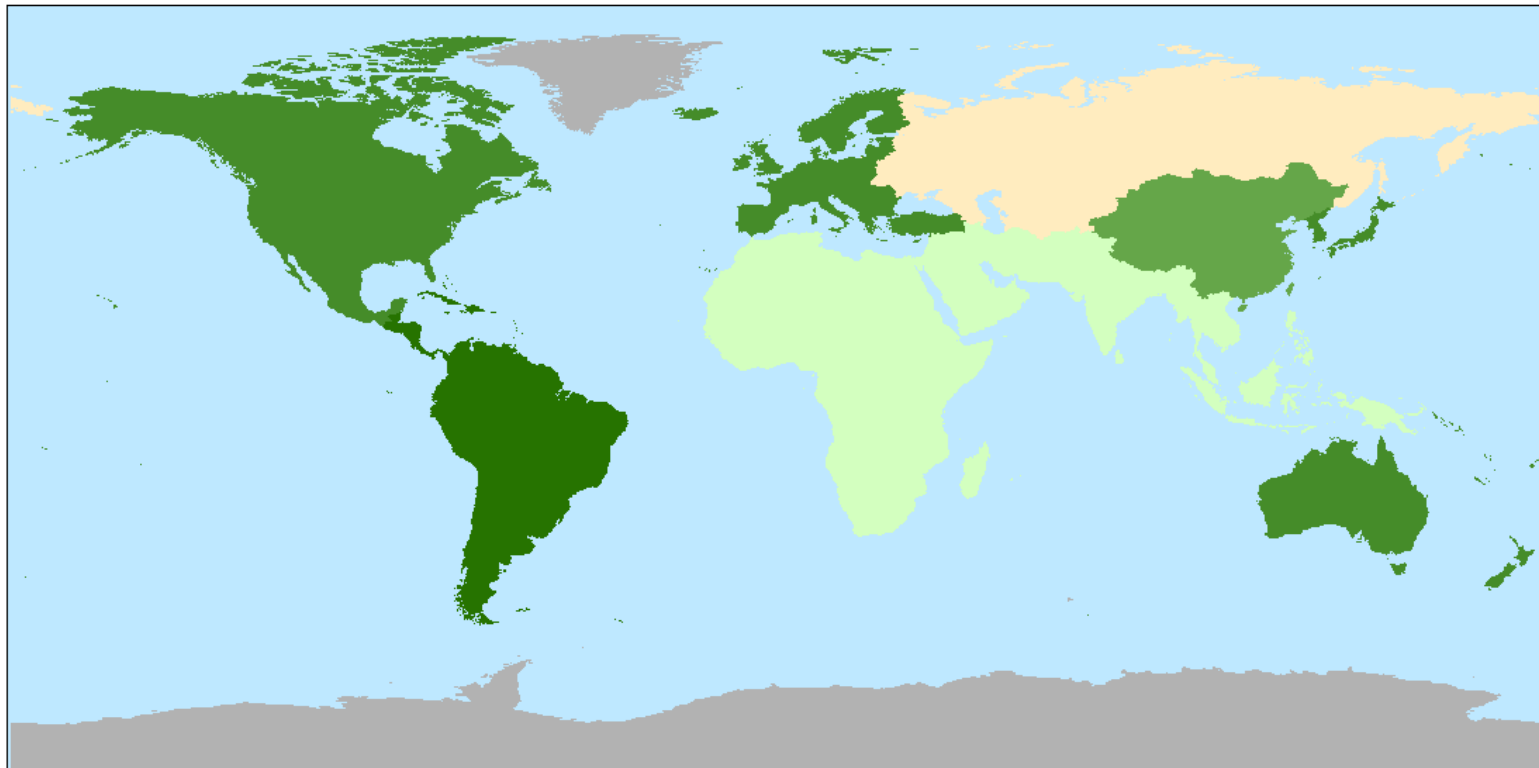
5. Valuation data points



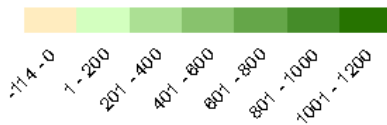


6. Benefits from AKST option

Agricultural Productivity - High AKST



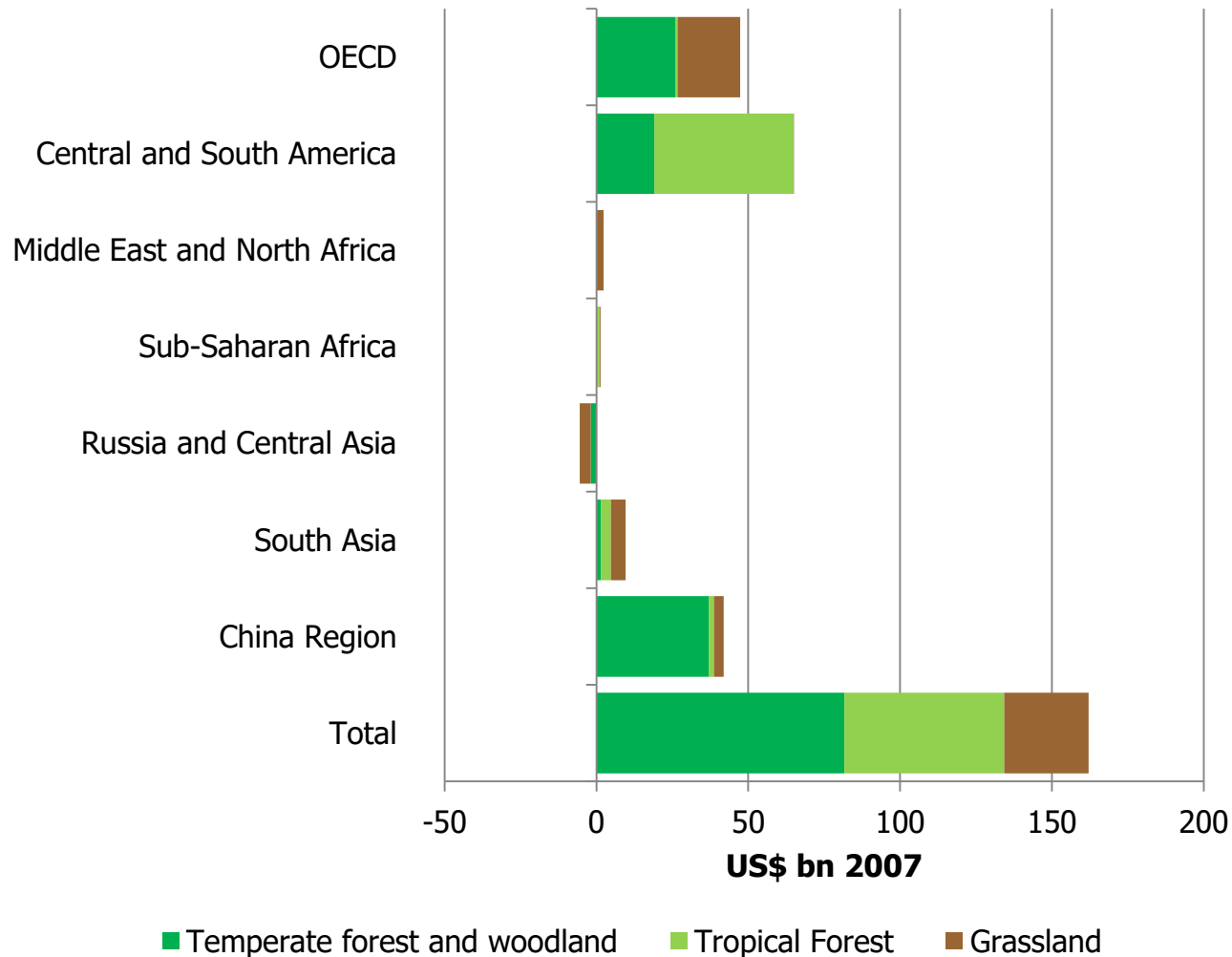
Value change 2000 to 2050 (US\$ bn 2007)





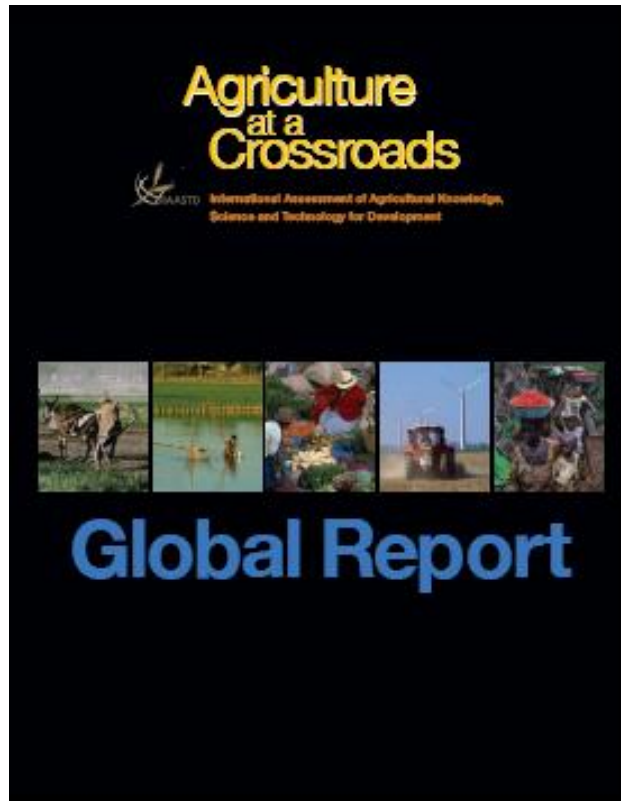
6. Biome-specific benefits: AKST

Annual value of high AKST in 2050





7. Cost assessment: AKST





Copenhagen Consensus 2012: Biodiversity

- Benefit-cost ratio is worst case 7.5 at 3% discount rate
- Our cost estimate derived from *Agriculture at the Crossroads* is 14.5 billion USD/annum (2007USD) – considerably higher than figure used in *Hunger and Malnutrition CC* paper
- Does not include all ESSs

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